MODIS Team Meeting Minutes

Minutes of the MODIS Team Meeting held on Tuesday August 9, 1994.

Action Items:

91. Clarify the round-robin BRDF measurement requirements. Assigned to Guenther. Due 8/16/94

92. Determine the best way to balance the scan mirror. Assigned to Roberto. 7/19/94. Due 9/ 6/94.

93. Review the Instrument Flight Operations Understanding of 8/26/93. Provide comments by 9/30/94. Assigned to Roberto 8/ 8/94

The following items were distributed:

1) Weekly Status Report #150
2) SBRC Memos submission from week #142
3) Minutes of the previous team meeting

Attendees:

✓ Richard Weber	Bruce Guenther	✓ Larissa Graziani
✓ John Bauernschub	✓ George Daelemans	Bob Martineau
✓ Rosemary Vail	✓ Patricia Weir	✓ Bob Silva
Lisa Shears	Mitch Davis	✓ Robert Kiwak
✓ Mike Roberto	Ken Anderson	✓ Harvey Safren
Nelson Ferragut	✓ Rick Sabatino	✓ Ed Knight
✓ Gene Waluschka	Cherie Congedo	✓ Harry Montgomery
✓ Bill Barnes	✓ Jose Florez	Marvin Maxwell
✓ Les Thompson		✓ Bill Mocarsky

MODIS Technical Weekly August 12, 1994

Code 700 team members please get your requests for FY-95 funds to me as soon as possible.

System Performance Workshop

This workshop was held on August 11 and 12 at SBRC. Attendees from GSFC included Bill Barnes, Bruce Guenther, Ed Knight, Gerry Godden, Eugene Waluschka, Dick Weber, David Jones, and Mike Roberto. SBRC attendance included Tom Pagano, Jim Young, Oscar Weinstein, Tom Kampe, Lee Tessmer, Sam Pellicori, Neil Therrien, Bill Holzer, Joe Banuck, Dzung Phan, Terry Ferguson, and Linda Sessler.

A list of action items and comments has been prepared in conjunction with SBRC:

Near Field Response Meeting

From T. Pagano, M. Roberto

Action Items and Agreements 8/12/94

1) Engineering Model (EM) scattering measurements will be done with the Integration and Alignment Collimator (IAC).

2) Spectral Measurement Assembly will have a 5 to 7 Angstrom mirror.

3) A broadband (~3000 K) source will be used for Scatter Measurements

4) A few narrow band filters will be used with the IAC for scatter measurements.

5) The Spectral Scatter Measurement Assembly (SSMA) will be used for Protoflight (PF). The degree of sophistication will depend on EM test results.

6) SBRC shall measure PF radiometric calibration vs scan angle.

7) Action for GSFC: Detailed (high fidelity) analysis of scatter in the scan cavity. The results would determine the need for PF near field scatter measurements vs scan angle.

8) SBRC to investigate the costs associated with separating out band 20 as a separate coating.

9) SBRC to investigate the performance implications to the cooler and ghosting of tipping the SWIR/MWIR cooler window.

10) SBRC to investigate baffling of the Spectroradiometric Calibration Assembly (SRCA) collimator to minimize stray light effects. Also investigate potential benefits of moving/reducing the SRCA fold mirror.

11) SBRC & GSFC to team to investigate possible corrections for the spurious response effects in the filters.

12) SBRC to investigate costs associated with improving mirror scatter requirements: Scan mirror, fold mirror, primary mirror.

13) GSFC to investigate the potential impact of contamination to near field scatter.

14) SBRC to keep the along track reticle for spatial registration knowledge in the SRCA.

15) SBRC will consider removing Ge detectors from the Solar Diffuser Stability Monitor (SDSM).

16) SBRC to investigate use of ribbon filament lamp for IAC near field response testing.

The IAC has been used to measure ghosting/crosstalk for the visible (VIS) and near infrared (NIR) focal planes for the EM Aft Optics Assembly (AOA) in the high bay. Preliminary test results indicate the possibility of high ghosting/crosstalk. However, there is the possibility that there may be other noise sources.

Mainframe Testing at Honeywell

Thermal testing was completed and vibration testing has begun. As of late last week (about August 12), Z axis vibration was complete and had been followed by a low level sweep. Jack Brooks indicated there were no problems with the Z axis test. Y axis is being done today (August 15). The X axis will be done over the next couple of days.

Nelson Ferragut and Cherie Congedo are covering the test for GSFC structural engineering. The structure has more damping than was assumed, which is good for MODIS. The structure sounds quiet, except for a few creaks which were heard. The first significant mode is at 46 Hz; 90 Hz was expected. The lower fundamental frequency may be due to flexibility of the mounting fixture. The 90 Hz mode is still being seen. However, the flexibility of the mounting fixture provides another reason why these tests will not

provide modal survey information (modal survey information was not expected in these tests because of the possible non-linearity of the response of the kinematic mounts).

There was a problem with a plastic spacer for a spring for the kinematic mount. The spacer did not fit in the hole and was left out after consultation with Steve Raymus of Martin Marietta Astro Space (MMAS).

Systems and Calibration Telecon

The bi-weekly telecon was held on August 8. Participants included Tom Pagano, Neil Therrien, Jim Young, Bill Barnes, Ed Knight, Harry Montgomery, and Mike Roberto.

Based on Terry Ferguson's APART analysis, Gerry Godden believes the scatter from the primary mirror and fold flat may be much higher than the scatter from the scan mirror. Jim Young does not believe this. At this time, this remains an open issue.

The VIS filter data was exactly what Ed Knight wanted.

Robert Wolfe of HSTX has made calculations indicating an accuracy of the scan mirror encoder which is less than that calculated by Joe Kleeburg.

Tom mentioned that a memo has been prepared by Tom Kampe which has filter data for the as built EM and PF filters. It includes performance parameters, etc. About seven deviations on the PF. Two filters are 0.1 nm out, the others are 0.3, a couple are out by more.

Neil Therrien mentioned that the cooler was taken down so there could be a change in the eye lens.

Jim Young has been spending a lot of effort on the Spectral Scatter Measurement Assembly (SSMA). Modeling has been done relative to spectral band registration.

The following is the minutes of the systems telecon as prepared by Tom Pagano:

Minutes from the August 8, 1994 Systems Teleconference with NASA GSFC

NASA Personnel: Bill Barnes, Mike Roberto, Harry Montgomery, Ed Knight SBRC Personnel: Tom Pagano, Jim Young, Neil Therrien

Barnes:

An action team has been put together to investigate the spurious light effects. Coming to SB will be Weber, Barnes, Waluschka, Knight, Gerry Godden, and Bruce Guenther.

Feeling the SSMA may be growing in scope and becoming more expensive than originally proposed.

Interested in the overall effects of Ghosting, Crosstalk, and Scatter.

An analysis was performed by NASA regarding the scattered light phenomenon. The conclusion that the primary/secondary contribution could be 10 x to 100 x larger than the scan mirror.

Pagano/Young: SBRC does not concur.

Roberto

An analysis by NASA (Claudia Woods?) indicates that the 200 rpm is not a concern with respect to the bearing lubricant. Possible retainer imbalance, but that is not likely. Test duration should be less than a couple seconds.

Reference from Steve Neeck: A Fujitsu dynamometer-3 axis type will do the balance job. Believes it uses three load cells. It can measure to 0.004 N level.

Calculation of the magnetic field of the ASTER on MODIS: Roger Stone went to MMAS to get an update on this analysis.

Responded to A. De Forrest on new titanium mount design. Basically use the new titanium mounts for launch; use the SS. mounts for vibration testing. SS mounts and new titanium mounts have same design.

Pagano: Is there an opportunity to vibrate with the new mounts?

Roberto: Will look into this. Wants to fly stainless, but apparently some concern with this.

Montgomery: Had a document written by Che given to Eric Johnson. Spent a couple hours with Eric discussing it. A couple of misunderstandings/discrepancies. Wrote a new memo and wants to fax it to SBRC. Wants to converge on an algorithm. Will discuss fax when they arrive here.

Knight:

T. Ferguson memo on scatter was reviewed.

Testing plan not written up. Wants to discuss SSMA at Thursdays meeting.

Geolocation folks interested in how SBRC measures mirror angular velocity accuracy. Bob Wolfe believes we should only be able to measure to 0.0013, but we measured to 0.0003.

Barnes: IFOV issue presented to science team last meeting. Abbot, etc. were not too concerned. J. Barker wants to think about it some more. No knee-jerk reactions to change it at this point.

Knight: Spectral simulation model looks good. Received the VIS spectral data and will analyze it for statistical variations.

Roberto: Number of potential subarrays of PV based on splinter session in June. Believes we have enough to yield 2 complete sets.

Pagano: We have 11 subarray sets selected with parts A- or better, and many more to be investigated. Cold background probing should identify any additional sets. There is a good probability of obtaining parts that meet specs for PF and F1. We have already started the hybridization process.

Therrien: Final alignment of cooled spectral bands in process. Also observing spurious light effects in the SWIR/MWIR. Inserting filters to find out spectral nature of phenomenon. We are also performing a scan of the filter/mask assemblies as a subsystem.

Young: Spectral Scatter Measurement Assembly will be covered at Thursday's review. Has done modeling with respect to registration of the 250 m and 500 m with the 1000 m and has found that the 1 - 2 - 1 algorithm results in extremely low errors.

End of Tom Pagano's report on systems weekly.

Software

Rick Sabatino is working on paring down the metrics. There will be little Configuration Management (CM) on the test analysis software for the EM. There will be formal CM on the PF. Software used for integration and acceptance testing of instrument will be under formal configuration control.

It is now understood that the calibration data comes down in the day and night mode.

More OASIS development will be needed.

Quality Assurance

Bob Kiwak mentioned that Terma post samples have been received and are being tested.

Bob Silva mentioned that Pat Dallosta has commented in a memo on the need to make use of the thermal analysis results in determining thermal stresses on MODIS electronic components.

Integration and Test

Harvey Safren mentioned the following:

1) The blackbody was heated to 100 degrees C.

2) There is no method to align the IAC to MODIS when MODIS is in the chamber.

3) There is concern about IAC and SSMA costs and the possible need for a second IAC.

Detectors

Les Thompson recommended that Bob Martineau or he go to SBRC and look at the raw detector data, maybe get a room in which to work.

Thermal

George Daelemans mentioned the following:

1) IR imaging of boards in air is half way through.

2) Some IR imaging of boards in thermal vacuum expected by the time of the QMR.

3) Has requested data on the thermal blankets from SBRC.

4) BRDF data being obtained on Earth door sample.

Optics

Gene Waluschka mentioned that a lot of data is not making it into the weeklies. Should we be requesting more of the test data so we can work with it here at GSFC?

Mike Roberto

August 15, 1994